Agricultural Agent
ASTORIA, OREGON

REPORT OF THE

CLATSOP COUNTY AGRICULTURAL OUTLOOK CONFERENCE

CONDUCTED IN ASTORIA, OREGON
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FOREWORD

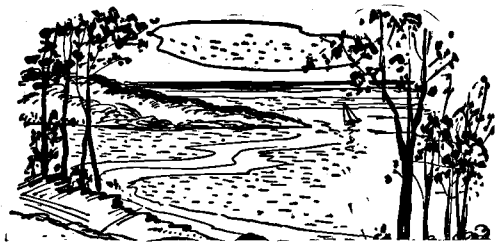
The publication of these reports in bulletin form is made possible by the cooperation of the County Court and the Astorian-Budget, in which these reports have appeared from time to time.

The County Court paid for the materials and other necessary expenses of publishing these reports. These cooperators sense the value of agriculture in this area, and desire that every farmer in the county receive a copy of these reports for further reference on the recommendations worked up at this Conference.

The committees, listed elsewhere in this publication, held numerous meetings before the general Conference, collected data and made studies of various enterprises on which the recommendations contained in these reports are based.

It is the desire of the group, cooperating, that this publication be used by farmers and those interested in agriculture in this county; that it be retained for future reference concerning agricultural conditions and recommendations for this section.

A. ZUNDEL, County Agent.



TEXT OF POULTRY COMMITTEE REPORT

Oregon produces a surplus of eggs above the needs of state consumption, this surplus being exported to distant markets, principally on the Atlantic seaboard and California. The major part of the commercial egg industry lies in the counties west of the Cascades and the surplus eggs of Oregon must be of high quality to meet competition from other districts and to justify transportation costs to outside markets.

Western Oregon is well adapted to commercial egg farming, the extent to which the industry will increase depending upon the progress farmers of the state make in shaping production to meet requirements of outside markets and in conducting a well-defined breeding program.

The industry has weathered the storm of depression in a creditable manner, expanding in Oregon and elsewhere as well. Oregon eggs are meeting keen competition from sections near its eastern market centers but if the state preserves present market outlets or develops a real industry for which western Oregon is particularly well adapted, many small farm flocks must be changed into better business units.

Many Farms Have Poultry

In 1930 Clatsop county had 694 farms and 857 in 1935, an increase of 163 farms. In 1930, 522 farms, 75 per cent of them, kept poultry. The value of poultry and eggs produced was $395.593. The industry underwent some decrease during the years of depression but established poultry farms remained in business.

The poultry industry of Clatsop county or any farm in the county can not be considered a unit in itself but must be considered in relation to the status of the entire industry. Clatsop county produces a surplus of eggs which as a contribution to a state surplus must be marketed outside the county and state.

The poultry industry is one that should be expanded along commercial lines in the county. The climate, availability of green feed, experienced operators, and the nature of the land area all are factors which should influence a commercial industry.

Producers of eggs in Clatsop county have the choice of selling through established independent dealers or egg cooperatives, those of the coast states maintaining their own sales headquarters in eastern cities. The growers' choice of market outlets has been brought almost to his door, a cooperatives branch station being operated in Astoria.

Growers also have the choice of purchasing their feeds and supplies from independent dealers or cooperatively.

The export demand is for white shelled eggs, this demand naturally resulting in the Leghorn and other white egg breeds dominating the situation. This does not mean the exclusion of the heavy brown shelled breeds such as Reds, Rocks, and others from Clatsop county farms.

The demand for eggs from well-managed flocks of both breeds to supply hatcheries within and out of the state, and meat for the coast tourist trade sould be considered by many farmers as additional market outlets.

Oregon Production Light

Oregon produces only one per cent of the nation's poultry products, thus having little voice in setting prices. Producers here operate on a margin between New York prices minus the overhead of delivering eggs of certain grade to outside markets.

The industry here and throughout the nation will expand in all phases throughout 1936 as a result of favorable prices in 1935. An increased number of pullets next fall likely will have a depressing price effect that may be offset partly by an increased consumer demand.

Egg consumption has declined since 1932 but higher prevailing meat prices will tend to place eggs in a more favorable position.

As a result of better egg prices in the United States and a favorable foreign rate of exchange, the imports of dried, frozen, and shell eggs from China and Russia increased rapidly during 1935. The tariff on foreign eggs was sufficient during the years of low prices and normal

exchange conditions. Efforts to remedy the foreign egg import situation failed because Congress neglected to pass an excise tax law. The imports for 1935 were in excess of 15,000,000 dozen shell egg equivalents.

The poultry business as a planned farm enterprise in Clatsop county is sound business. A number of new farms; rehabilitation, resettlement, and subsistence farms will keep poultry. If poultry expansion is toward barnyard flocks rather than those large enough to justify commercial care, Oregon can not economically long meet export market requirements.

Approximately 77 per cent of the farmers who keep chickens in Clatsop county have less than 200 hens. These flocks are too small to justify frequent gatherings, proper farm storage facilities, frequent deliveries in case lots and other factors necesary to an industry on an export basis.

The outlook of the industry depends largely upon whether the farmers who keep poultry make a reasonable effort to adjust their poultry units in relation to the demands which prevail in established markets.

Farm Flocks Should Be Small

1. For Clatsop county farms desiring small home table flocks from which eggs do not enter trade channels, it is recommended that flocks of two dozen hens or less be kept.

2. The farms that plan a sideline cash income from poultry from which eggs will go into trade channels, should have a flock of not less than 400 to 500 hens.

3. A farm which expects to derive its major source of income from poultry should develop a business unit of approximately 2000 hens.

4. For a well-rounded specialized poultry farm program operated under natural conditions of ranging young stock, an acreage of 20 acres is recommended. Where artificial confinement throughout is practiced, less acreage is needed, rearing under artificial confinement being successful for a few but not endorsed for all.

5. It is recommended that from 50 to 60 per cent of the laying flocks be replaced with pullets each year.

6. In purchasing day-old chicks caution should be observed that they are from pullorum-free parent stock when possible, or from accurately blood tested parent stock with all reactors removed.

7. Chicks under average conditions and equipment should be purchased at one time, February, March, and April being the three months in which the majority of Oregon chicks are purchased.

8. There are two types of brooder houses in general use by those in the industry, each designed to overcome losses from soil contamination.

a. The permanent brooder house, equipped with artificial yards such as wire, concrete or board floor. (See county agent for Extension Bulletin 451.)

b. The portable brooder house equipped with skids for moving to clean soil. (Extension Bulletin 446). The permanent brooder house is in general use throughout commercial regions because of less labor overhead.

9. Shelter houses closed on three sides are recommended for young stock on the range. (Extension Bulletin 442).

10. Green feed should be provided throughout the growing period and fed liberally until the pullets are in production, reduction then being possible to avoid too dark yolk color. Kale is the main green feed crop with carrots supplying winter succulence in case of a freeze.

11. The greatest economic loss to the poultry grower is in the quality of the eggs on the farm after they are laid and before they reach the grader's candle. "How to Construct an Insulated Egg Room" is shown in Extension Bulletin 445.

12. Extremes in temperature have shown that laying fowls do better in partially insulated houses. Plans for this type of house and others as well are shown in Extension Bulletin 480.

13. More capital is required to develop a safe poultry enterprise than the amateur anticipates. Exclusive of land and the home, it will require a first year investment of approximately $2.50 to $3.00 per pullet before production starts. This expenditure when prorated will include cost of brooder, fuel, feed, litter, cost of chicks, mortality losses, houses and equipment. A well-defined plan should be followed to give the best protection to the

investment involved.

14. It is urged that poultry growers give consideration to the present movement by turkey and poultry growers to combat thievery by:

(a) Making poultry stealing a felony.

(b) Encouraging a wider use of tattoo and registered branding.

(c) Requiring all dealers to display a list of registered brands. The present law requires dealers to keep a record of all branded poultry purchased.

(d) Publishing annually a booklet of all registered brands, placing a copy with every peace officer in the state.

(e) A grower purchasing branded birds from breeders would get a bill of sale in order that he could present it when offering birds of a different brand than his own.

15. The purchase of sexed chicks for farms specializing in commercial egg production in the county is generally endorsed.

16. It is recommended that the present law relating to the disposition of dog tax license money be amended to include indemnity for poultry killed by dogs.

COMMITTEE

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John Lahti,
E. J. Saunders,
C. McConnell,
Alex Lindfors.

REPORT OF TRUCK CROPS COMMITTEE

Clatsop county truck crops include peas, cauliflower, broccoli, carrots, lettuce, cabbage, potatoes, beets, rutabagas, brussel sprouts, beans, rhubarb, squash and pumpkins and berries. Separate treatment is given the various crops to better differentiate their advantage or disadvantage for production in Clatsop county.

Garden peas, green beans, sweet corn, carrots, beets and spinach can be produced in quantities in Clatsop county, the limiting factor connected with production of these crops being the market facilities.

Without adequate processing and marketing facilities production of many of these truck and berry crops in commercial quantities can not be realized. Berry crops that can be produced in commercial quantities are the Evergreen, strawberries, and possibly red raspberries. The loganberry is a good producer under favorable conditions and Youngsberries show promise in sheltered localities.

Pea Acreage Increases.

The 1935 acreage of garden peas for fresh market purposes was estimated at 250 acres for Clatsop county. Census figures for 1929 gave the acreage as 33, an increase of 217 acres during the six year period.

Estimates indicate the 1936 acreage of peas for fresh market purposes will be reduced 25 to 50 per cent because of difficulties in 1935 from drought, insects, disease, unfavorable markets, and low returns to the grower.

Carload shipments of green peas for the United States in 1934 were 6852. Of this number California shipped 4103 cars; Oregon 69 cars; Washington 606 cars, Utah 42 cars; and Idaho 282 cars.

The chief limiting factors in the production of garden peas in Clatsop county are diseases and insect pests. Experimental work for the control of these pests and diseases should be continued by the local experiment station.

Another factor is the cost of production which in the case of the tall telephone peas grown under Clatsop county conditions is 3½ to 4 cents per pound. Seed peas should not be grown in Clatsop county because of the danger of harboring such insect pests as the weevil and the pod borer.

Barnyard manure should be used when available as fertilizer for peas. These manures may be supplemented with potash on the highly organic soils while on the non organic soils very little if any increased production has been noticed from the application of potash. Phosphorus fertilizer is important for field pea production, especially in combination with barn yard manures. Where manure is not available some form of nitrogen fertilizer such as calcium nitrate or other nitrogen bearing fertilizers may prove beneficial. Two tons of lime per acre for garden peas proved advantageous near Warrenton.

In the northwest there are numerous instances of the value of inoculation on peas even when grown recently on the same land.

The marketing of garden peas from Clatsop county by consignment on open end contracts is not a satisfactory arrangement for the grower. The grower who sells garden peas under such arrangements must take the gambler's chance on getting a satisfactory return. The same is true when selling for cash after the crop has been produced.

Clatsop county should investigate the possibilities for encouraging the locating of a processing plant in this district. Estimates indicate 500 to 1000 acres of peas could be seeded annually.

The Clatsop area is expected to continue relatively free from pea weevil, a condition that may be an advantage for future production of garden peas for processing purposes

Experimental pre-cooling to improve the condition of the fresh peas going to eastern markets may aid those handling peas for the fresh market, quality being necessary for market peas shipped from this district if repeat orders at favorable prices are to be expected.

There must be greater care exercised generally by growers in protecting peas at the farm after they are picked, the grower and shipper

cooperating to get peas on ice as soon as they are harvested.

July Cauliflower Market Available.

Possibilities prevail for producing cauliflower in Clatsop county for July markets. Although California ships 5000 to 6000 carloads annually of the 8000 to 9000 carloads produced in the United States there are few shipments made by that state between June and October. Colorado's heavy shipments are in August, September and October. Washington ships in June, July and August, shipments from that state the last three years ranging from 73 to 183 cars.

Corn Market Is Local.

Golden bantam sweet corn of fine quality is produced locally in the more sheltered locations. Markets are confined to local stores and the summer trade at the Seaside resorts, shipment to the Portland market generally being too expensive.

The corn ear worm is not as serious at present in Clatsop county as it is in the interior of Oregon

Those interested in producing truck crops should combine their program with other enterprises, such as livestock or poultry production. Truck crops that can be fed to livestock or poultry are valuable as growers are not encouraged to entire farm income. Soils for truck depend on a single crop for their crops must be deep and well drained as well as fertile.

Truck crop lands in the lower areas should be protected from leaching during the winter months by the growing of a cover crop of winter grain, vetches, Austrian field peas, or in fact any crop which will make winter growth and soluble plant food which otherwise would leach out of the soil. These cover crops may be fertilized with manure, or commercial fertilizers containing nitrogen, phosphorous and potash.

Uplands for truck crops are prepared for high production purposes by fertilizing with barn yard manures supplimented with superphosphate. When barn yard manures are used cover crops also should be grown. Applications of lime should be made where practical. Late February applications of nitrogen and superphosphate may be made to force the cover crop and there is no objection in using a complete fertilizer containing nitrogen, phosphate and potash.

Fruits Briefly Discussed.

Tree fruits have been considered only for the purpose of furnishing fruit for home use and possibly an occasional roadside or other local market.

Apples—Summer variety, yellow transparent; fall varieties, Gravensteins, King; winter varieties, Northern Spy, Spitzenberg, Jonathan; crabapples, Large Liberrian, Hyslop.

Pears—Summer, Barlett; winter, Bosco.

Sour cherries — Montmorenacy, Early Richmond.

Sweet cherries — Royal Anne, Lambert. For sweet cherries use proven pollenizers.

Plums and prunes — Italian prunes, Green Gauge plum.

The planting of walnuts and filberts is not recommended as a general practice but in certain sheltered locations Franquette walnuts are producing a fair crop for home use.

Barcelona Filberts with a Du Chilla polenizer also are quite satisfactory. These sheltered locations should be several miles inland and protected from ocean breezes.

Small Fruits May be Produced.

There is a possibility that the red mite disease which infests the evergreen blackberries and prevents ripening may throw the major part of the uncultivated blackberry area out of production, thus forcing the production of the berry to cultivated areas where it can be protected by sprays against the red mite.

Clatsop county has an acreage suitable for producing large tonnages of a high quality evergreen blackberry when processing facilities are available and market demands warrant the production of this crop.

Red raspberry production is in sheltered localities and on rich well drained lands, the Cutbert being the leading commercial variety The Lloyd George berry also has made a good showing in the coast region, being a suitable pie and jam berry, and more hardy than the Cutberts.

The Plum Farmer is a leading black cap in Oregon and the Cumberland probably rates second. Black cap production is reported successful on tide and hill lands in sheltered locations.

Strawberries may be planted for home use where a succession of varieties are wanted. The Narcissa in trials conducted by the county agent in Clatsop county has been a good producer for fresh fruit purposes. The Marshal, a leading berry for frozen pack purposes in the northwest, may be grown on upland ground.

Canning varieties of strawberries used locally are the Ettersberg 121 for heavy soils and the Corvallis, a canning variety that has proven successful in demonstrations by the county agent. There are several varieties that appear to be valuable in the communities where they are produced. The everbearing strawberries offer possibilities for summer resort trade, the Rockhill being the number one variety with the Mastadon second. Yields of the Rockhill are heavy and the berry has a fine flavor. There are 40 varieties of strawberries on trial at the local experiment station and opportunities to observe their adaptability to local conditions occasionally will be afforded.

The Perfection variety of currant is recommended for growing in Clatsop county.

For gooseberries the Poorman and Oregon Champions are leading varieties.

Soils for small fruits should be deep, well drained, and fertile. It never is satisfactory to try to build up a worn out or depleted soil for small fruits after the crops are planted, the most satisfactory method being to improve these soils before planting with barn yard manures and cover crops supplemented by lime and commercial fertilizers.

Vegetable Seed Industry Has Possibilities.

Vegetable seed may be grown in sheltered locations of Clatsop county. Market outlets must be developed if seed is to be produced commercially.

Cooperative Organizations Proper.

Development of berry and vegetable production centers in Oregon and Washington communities which have dependable and steady outlets and dependable returns to growers

SMALL SEED CROP COMMITTEE REPORT

Clatsop county seed values are aomng the highest in the Oregon counties, it being the leading bent grass seed producing county in the United States, producing between 60 and 70 per cent of the fine bent grass seed sold in the United States. Receipts from this 10-year-old industry are $150,000 to $175,000 annually at present production and prices.

There is a tendency to increase production here and elsewhere, but the present increased acreage of fine bent grass in Oregon and Washington is considered about large enough to supply present American demands. Fear of surplus caused price cutting and lowered values 20 to 25 per cent per per pound under the opening figure and probably 10 to 20 per cent per pound below a fair price, forcing growers and dealers to lose money unnecessarily.

It is believed by those familiar with the market that the entire 1935 crop can be absorbed and that the tendency toward slow purchasing by the eastern trade is based largely on lack of confidence caused by price cutting among growers and dealers.

A meeting was held in December, 1935, and the five dealers and handlers in Astoria bent were urged to get together and attempt to establish a stable price and prevent further losses. This was accomplished and the price has been in general effect since January, 1936.

Bent Grass Production Centers in Oregon.

It is believed that with almost the entire production of bent grass centered in the Pacific northwest and practically all of it in Oregon that a majority of producers and handlers can come to an understanding on orderly marketing of the crop with more profit to themselves and greater confidence on the part of the eastern buyers.

Due to the extensive production of bent grass and a tendency to increase acreage, the following recommendations are made:

Increase in the acreage of bent grass for seed purposes are not justified at present.

Some of the low yielding and low quality acreage may well be replaced with other crops.

Producers and growers of bent grass in Clatsop county work cooperatively in the interest of a stable price for Astoria bent grass seed of all grades and the elimination of disastrous price cutting.

The extension service of the state college is urged to use every effort to create a similar understanding among producers and handlers of bent grass in all the districts in Oregon and the northwest.

Serious consideration should be given to mean of increasing the use of bent grass seed by bringing its merits as a lawn and turf grass to the attention of the consuming public in the eastern states and by promoting its use in pasture mixtures to which it is suited.

Higher Standard Advocated.

Standards for certified Astoria bent grass should be raised so that a better quality of seed will be placed on the market. The minimum purity for Blue Tag Astoria bent should be fixed at 98 per cent. The maximum of foreign seed should be 25/100 of 1 per cent and the maximum number of the "special" seeds fixed at 1800 per pound. Investigation is recommended for possible revision of the Red Tag grade including removal of musty seed from the Red Tag grade.

The demands for labelling and prompt shipment of the large quantity of bent grass seed harvested in Oregon are such that prompt service must be had in connection with testing and certification. It is recommended, therefore, to the experiment station and to the extension service of the Oregon State Agricultural college that facilities be provided for prompt testing of bent grass seeds for purity and germination and that a full time assistant be employed to care for the certification of bent grass and other seeds.

Other Seed Developments Noted.

Several other seed crops are worthy of consideration on a somewhat extensive scale, one of these being English or perennial rye grass. This grass is suited to lands not subject to much overflow and will do best on the better drained

tide lands. Nearly 600,000 pounds are imported into the United States each year. The demand for English rye grass is principally for special hardy strains that are quite free from Italian rye grass. This crop is sowed at 20 pounds per acre, generally in late summer or early fall, and the stand may be expected to last six to eight years.

Yields generally are 800 to 1000 pounds an acre and the price should be at least 10 cents per pound for certified seed of approved strains. All foundation stock seed should be examined and approved by the Oregon Agricultural experiment station before sowing, only approved certified strains having a likely market on the eastern pasture and lawn markets.

Rough Meadow grass, formerly called rough stalked meadow grass, is used in many lawn grass mixtures. Imports range as high as 400,000 pounds annually. The usual price is 25 to 30 cents per pound. It seems well suited to the better types of tide land and other lower foot hills just above the tide lands. The grass frequently is found growing in many of the Astoria bent grass fields and is definitely suited to the conditions in this area. Its tendency to lodge and shatter rather easily suggest that it be tried on a somewhat limited scale until sound production practices can be determined for Clatsop county. Market expansion may be expected as local production develops.

Chewing Fescue as a seed crop appears to do best on well drained land, annual importations during the past 10 years averaging approximately 1,000,000 pounds per year and wholesale prices varying from 11 to 60 cents per pound. The crop has yielded from 100 to 400 pounds per acre in Oregon. It is a long time perennial and is believed to be worth trying on many of the reasonably fertile hill lands and possibly some of the soils of Clatsop Plains. While the imported seed from New Zealand is used largely for fine turfs, it will be used extensively in western Oregon and the Pacific northwest for pastures when the seed supply is assured at a reasonable price. The principal competitor is New Zealand, American prices being dependent to some extent on the New Zealand supply. American seed, however, usually is better quality because of its much higher germination.

Common white clover is imported at the rate of 1,000,000 to 1,750,000 pounds per year. It grows wild on some of the bottom lands of Clatsop county and where these are level enough to allow harvesting such a short stemmed crop, it may be expected to be profitable. Yields of 100 to 300 pounds of seed per acre may be expected with prices varying from 18 to 35 cents per pound.

Size of Farms Decreases.

Statistics indicate a tendency toward smaller farms in Clatsop county and a substantially larger number of farmers. This condition coupled with the necessity for crops that fit into a rotation plan will necessitate the growing of some specialty crops capable of a large return per acre. Among such crops that are not produced in surplus in the United States are a number of vegetable seeds. These seed crops are produced principally in California or Washington, or imported.

Their production frequently is under such conditions that the uniformity of quality desired by growers and market gardeners is absent. Because Clatsop county and other coast counties have numerous small and somewhat isolated valleys, it is believed that the area offers much promise for vegetable seed production. Among these crops there are some that should receive serious consideration.

A popular variety of garden beet is Detroit Dark Red. This crop should be grown on well drained soils, the seed crop started in one season and producing seed the following season. Experience in Washington indicates a yield of approximately 1000 to 1200 pounds an acre with a price of 10 cents a pound. It is believed that by ridging the crop in the fall beets may be left in the ground during the winter and the cost of transplanting thus avoided.

Carrot seed production is light in Oregon. This crop is quite hardy in Clatsop county and also appears to be quite free from danger of cross pollination with wild carrots. Diseases in the carrot producing area of California should make this crop very easy to produce and market from Clatsop county.

Turnip seed is imported in large quantities for vegetables, stock root production, and cover crop purposes. The Purple Top White Globe is one of the most popular table varieties. Like beets, turnips probably would have to be ridged for over-winter protection. Production may reach 1000 to 1500 pounds of seed per acre and the price is from 7 to 8 cents per pound. Turnips must be grown away from all other members of the msutard or cabbage family to avoid cross pollination.

Cabbage seed produced in the northwest is criticized because of cross pollination and poor quality. The numerous isolated small valley areas of Clatsop and other coast counties that do not overflow appear to be ideal for the production o fthis crop. Cabbage seed is planted in late spring or early summer, plants being set out in late summer and the seed crop harvested the following year. Yields are expected to approximate at least 800 pounds per acre and prices vary from 25 to 60 cents per pound. Cabbage must be grown away from other cabbages, mustards, or similar crops.

Spinach seed is imported in substantial quantities and should be experimented upon in this area. It probably is best grown away from salt marshes as rust may be serious when the crop is grown near salt grass.

At the time of the passage of the tiriff act of 1930 tariffs on a number of the seed crops were raised because of the necessity for protecting established industries in certain seeds. As the acreage has increased and competition has become more acute, the necessity of maintenance of these tariffs is apparent. It is recommended that the tariffs on bent grass and the other seeds be maintained at at least the level established in the tariff act of 1930, and the restoration of the tariffs on alfalfa, alsike clover, blue grass, and timothy which were reduced in the Canadian reciprocal trade agreement. Restoration is desired of the tariffs on bulbs, nursery stock, and vegetable seeds which were reduced recently in the Netherlands reciprocal trade agreement.

In connection with crops becoming important under actual production in Oregon since the passage of the tariff act of 1930, tariff increases are recommended on English rye grass seed to 7 cents per pound; rough meadow grass seed to 9 cents per pound; and on Chewings fescue seed to 8 cents per pound. These suggested tariffs are unlikely to increase the level of prices to American users but will tend to reserve the market for American seed producers.

REPORT OF COMMITTEE ON SOILS, IRRIGATION AND DRAINAGE

Because of the fact that the area of tillable land in Clatsop county is to small in proportion to the toal acreage of the county, it is extermely important that any permanent agricultural program followed in this county provide for the full conservation and utilization of this valuable natural resource. According to the 1935 census, there is an area of only 14,496 acres of improved land in Clatsop county farms. Practically all of the agricultural income of the county is derived from this area.

Since 1880 the average area of improved land per farm in Clatsop county has been reduced from 69 acres to only 17 acres. The soils committee wished to point out that the best possible use must be made of this smaller area if the farm population of the county is to maintain a satisfactory standard of living.

All phases of agriculture are didectly affected by the productivity of the soil. It is extremely important that on each farm a program be followed that will maintain the natural fertility of the soil. Any long time agricultural program must provide for replacing of the plant food removed by the growing crop. The expense of replacing this fertility may be materially lessened if as much of the plant food as possible be returned to the soil. Where crops are fed to live stock it is possible to return the greater percentage of the plant food in the form of manure. All crop wastes and crop residues contain a certain amount of plant food and should be returned to the soil. Growing legume crops assist in maintaining the supply of nitrogen in the soil because of their ability to take nitrogen from the air and converting it into a form usable by the crops.

Crop Rotation. It is recommended by the committee that rotation of crop be followed on cultivated areas. On the hill lands it is suggested that a rotation, including legumes for two to four years followed by a cultivated row crop such as roots. On the tide lands and bottom lands it is recommended that the following rotations be followed: Hay followed by pasture and pasture followed by cultivated crops. The length of their rotation cycle will be determined by the length of time hay and pasture crops remain profitable. It is suggested further that the same row crops not occupy the same land more than two years in succession.

It is recognized by the committee that in this area lands should not be plowed and lie bare over the winter, except when previously in sod. Where a crop is to be grow on these plowed areas the following years, it is suggested that possibly a cover crop might be sown in the fall on this plowed land and turned under the following spring.

Barnyard Manures. Because of the fact that a large percentage of the farm income in Clatsop county is derived from the production of dairy products, an unusual opportunity is offered to maintain the fertility of the soil if the barnyard manure is properly utilized. According to the 1935 census there are 4800 dairy cows in Clatsop county. As determined by the present price of fertilizers, each cow will, produce enough manure to have a value of $30.00 if the plant food in this manure were purchased in the form of commercial fertilizers. It is generally agreed that because of present methods used in handling manure that 2-3 of the plant food in this manure is lost. The adoption of proper methods of handling could reduce this loss to not over 10 per cent. This saving would represent an additional income to Clatsop county dairy farmers of approximately $82,000 annually. Manure produced by other animals would of course have a proportion of value.

Plant food is lost from manure by bleaching and fermentation. It should be handled so that these losses are cut to a minimum. Because of the heavy rainfall encountered in this section, a covered storage space should be provided for

manure to prevent leaching by the winter rains, yet the manure should not be allowed to dry down to a point where fermentation occurs.

The committee strongly recommends the liquid tank methods of handling manure. Where this method of handling is used, practically all of the plant food is conserved and the manure is converted into a form so that it is easily handled and may be applied to crops with a minimum of waste. Experience has shown that where this method is used it will be necessary to construct a tank having a capacity of approximately 150 cubic feet per cow. Plans for such tanks can be had at the County Agent's office.

The committee recommends that the Astor Experiment Station begin experimental work immediately on the best methods of storing and handling liquid manure.

The committee recommends the use of superphosphate in place of lime for dusting barn floors as the phosphate is needed to help balance the fertilizer content of the manure, while lime causes loss of the plant nitrogen food, from the manure.

The committee points out, further, that experience has shown that manure applied on top of the ground after plowing and worked into the surface brings better results than where the manure is plowed under. It is also the opinion of the committee that better use could be made of manure by making generally lighter applications, approximately ten tons per acre. It is important that manure be applied to the soil at a time when growing crops will take up the available plant food easily. Spring or fall applications are best.

Lime Used In Clatsop County

1930—221 T; '31—(Oct. 1-Dec.1) —70 T; '32—100 T; '33—100 T; '34—190 T; '35—290 T. Total—1132 tons.

The soils of Clatsop county are generally acid in nature. This is caused by the fact that as the soils were formed they were subjected to leaching by the heavy rainfall in this area. Since these soils are acid in nature, the use of lime is generally necessary, and in a lot of soils its use is absolutely necessary for the growth of legume crops. It is important that legume crops be grown in this section because of the fact that legume feeds are needed to form a proper ration for feeding the dairy cows in the county. Furthermore, the growth of legumes is important from the soil fertility standpoint because their growth assits greatly in maintaining the supply of nitrogen in the soil.

Whether or not the soils will need lime may be determined by a simple soil test. This test is available, free of charge, in the office of the county agricultural agent. As a general rule, on the older agricultural soils in the county, an application of two tons of ground limestone per acre is necessary.

Since it is recognized that the use of lime is one of the important factors in the success of agriculture of this county and the present sources of lime, due to transportation, makes the cost to farmers rather high, your committee recommends that the general chairman of this conference appoint a committee of farmers representing various areas of the county using lime to investigate other sources and if possible bring to the county a source of lime cheaper to the farmers.

Commercial Fertilizers: Soils in this area are generally deficient in phosphorous and past experiments have definitely shown that many crops in this area will respond to applications of phosphate fertilizers. The practice of applying phosphate to crops in this area is well established.

The committee recommends that the farmers in this county bear these facts in mind, and that applications of phosphate fertilizers be made on a basis outlined below.

On root crops: 400 lbs. superphosphate or basic slag per acre. On peas and other truck crops: 400 to 600 lbs. superphosphate or basic slag per acre in combination with barnyard manure. Where manure is not available, the addition of 150 to 200 lbs. of nitrogen carrying fertilizer is recommended.

It is recommended that the county agent and Astor Experiment Station cooperate in carrying on experiments and field trials on the

fertilization of pasture and clover crops with the idea of increasing yields and lengthening the life of clover.

Until definite information is available, it is recommended that both pastures and hay meadows containing their stands of clover be fertilized with 250 lbs, superphosphate per acre annually.

In summarizing the fertilizer situation in Clatsop county, attention is called to the fact that there has been a decided increase in fertility on many of the farms in this county. In the pasture as the soil fertility is further depleted the use of commercial fertilizers will become increasingly important if yields are to be maintained.

Experience indicates that newly cleared uplands raise fair crops of clover and other things for 4 to 6 years when crop yields suddenly decrease to a non-profitable point. On diked tidelands experience indicates that the native fertility holds up exceptionally well to 10 to 15 years after diking and clearing, and after that time crop yields decrease rapidly and stands of clover are obtained with difficulty.

Trials over an 18-year period at the Astor Experiment Station point very definitely to a need for three practices in maintaining the fertility. They are:

1. The application of properly conserved barnyard manures.
2. The application of ground limestone at the rate of 2 tons per acre every 5 years.
3. The application of superphosphate or other phosphorous carrying material in the rotation on root crops at the rate of 400 lbs. per acre.

Also, as pointed out above, superphosphate, or basic slag, at the rate of 250 lbs, per acre should be applied in the early spring on clover seedings the first year in hay. These recommendations should be generally followed, although the Committee wishes to emphasize that in the main, each farmer will need to work out his own fertility program because of the many different variations in soil conditions on different farms.

Due to heavy rainfall in this area and the location and character of much of the better soil types in the county drainage is a major problem on most farms. The Committee sees the drainage problems in two divisions; Those dealing with bottom and tideland and drainage on hill land. It is felt that it is necessary to stress the importance of drainage, since but a few of the important cultivated crops will yield profitably on poorly drained soil.

On hill land it is suggested by the Committee that much can be done in the improvement of these lands by tile drainage. On tideland and lower land much can be done by intercepting drains where low land is bothered by a hill. These drains cut off the seepage from the hill and carry it into natural drainage outlets preventing the water from reaching the tide land.

On the low and tideland much improvement can be made by keeping drainage channels clear of annual growth and the use of underdrains on the improved areas. It has been the experience on tide land the most successful underdrains are those constructed with puncheon.

It is recommended by the Committee that because of the fact that each drainage problem is different and requires different methods of drainage that the services of the ones experienced be secured to design the proper drainage system.

Irrigation: Even though Clatsop county has a heavy annual rainfall, the distribution of this rainfall is such that there is very little rainfall during the summer months and, as a result, the production of many crops is retarded because of the lack of summer moisture. This is particularly true of pastures.

Experience with irrigation in this county has shown that where the water may be applied economically that irrigation is a very proper enterprise. Irrigated Ladino clover pastures to the dairman offers a possible source of cheap high quality feed. This pasture may be expected to have a carrying capacity of two to four cows per acre for six to seven months out of the year.

On some of the diked land in this area it is possible to irrigate by constructing a box through which the

water may be allowed to run over the land during high tide. Where this system is possible, the cost of irrigation water will be very low.

On other lands it may be necessary to pump water, since each farm will present an individual problem, it is recommended that anyone considering irrigation secure assistance from the office of the county agent in working out the most practical method of irrigation.

Where it is possible to properly prepare the land, some type of flood irrigation will be found to be the most economical. Where the land can not be properly prepared, there are several methods of sprinkler irrigation, which have proven economical in the coast areas.

There are many places along the smaller streams in the county where water may be diverted by gravity and carried out on to the land. The committee feels that wherever this is possible, that these projects be constructed.

Since the Astor Experiment Station has done some work on irrigating tidelands, more especially for pasture, this committee recommends continuation of this work and that as information is obtained the farmers be informed and given assistance through the Extension service in establishing systems.

Soil Survey: The soils committee feels that in order to work out a sound program of soil conservation and utilization in Clatsop county, that a soil survey of the county should be secured and for this reason, the committee recommends that the general chairman and secretary of the Conference prepare a resolution requesting a soil survey of Clatsop county and that they send copies of this resolution to the Oregon Experiment Station at Corvallis, the Oregon Congressional Delegation in Washington, D. C., and to the U. S. Bureau of Soils and Chemistry in Washington, D. C.

REPORT OF CROPS COMMITTEE

The tendency of agricultural development in Clatsop county is toward smaller and more intensively operated farms. There is a gradual but steady increase in the number of farms, but the area under cultivation remains about the same as shown in the following table:

Agricultural Development in Clatsop County.

Census of	All Land in Farms		Number of Farms	Average Size of Farms	Improved Land in Farms		Acres per Farm
	Acres	Per Cent		Acres	Acres	Per Cent	
1880	37,469	7.1	146	256.6	10,070	26.9	68.9
1890	48,369	9.2	236	204.9	13,212	27.3	55.9
1900	72,515	13.8	433	167.5	14,694	20.3	33.9
1910	54,221	10.3	369	146.9	12,730	23.5	34.5
1920	52,071	9.9	448	116.1	14,179	27.3	31.6
1925	53,672	10.2	537	99.9	15,307	28.5	28.5
1930	74,562	14.2	694	107.4	13,810	18.5	19.9
1935	52,908	10.1	857	61.7	14,496	27.4	16.9

Note—Total area of county is 525,440 acres.
Source—U. S. Census of Agriculture, retabulated by O. S. C. Extension Service from "Statistics of Agricultural Development in Oregon."

Income figures from sale of crops and livestock products for the last five year period are not available but a study for the period of 1926 to 1930 is as follows:

1926-1930 Average Cash Farm Income.

Tabulated by the Oregon State Agricultural College Extension Service

1926-1930 average cash farm income	$1,089,000.00
Per cent from sale of all crop products:	23.0
Field crops	7.5
Truck crops	.1
Tree fruits and nuts	
Small fruits, nursery, greenhouse, etc.	15.5
Per cent from sale of all animal products:	76.6
Poultry and eggs	20.3
Dairy products	41.1
Livestock and products*	14.3
Other animal products**	.4

*Includes cattle and calves, sheep and lambs, hogs, wool, horses, mohair.
**Includes rabbits, fur animals, honey.

It is realized that more recent figures would show increases in field crops due to bent grass and that truck crops have developed and now bring considerable income to the county.

Bent grass revenues for 1935 are estimated to be about $175,000 and gross returns for garden peas during the same year are estimated at $150,000.

Smaller farms mean more intensive cultivation and larger yield per acre if a family living is to be made from the farm.

The following crops come within

the scope of this report: hay crops, pastures, roots, small grains, cranberries, and bulbs.

The grass seed industry is covered in a separate report.

Hay crops produced in Clatsop county are annual and perennial. Census figures indicate that the acreage of various hay crops is about as follows:

	1909	1919	1924	1929	1934
Hay, all kinds harvested	3,844	4,853	6,295	6,028	6,451
Wild grasses	133	423	1,043	575	
Tame grasses	881	848	3,510	3,108	
Timothy and clover mixed	1,949	2,234	629	772	
Clover hay, all kinds	306	199	171	192	562
Alfalfa cut for hay	1	13	29	3	
Vetch and other annual legume hays		150		82	122
Grains cut for hay	563	768	913	1,296	913

U. S. Census.

These actual figures indicate a tendency on the part of farmers to increase acreage of tame grasses, to decrease plantings of legumes with the natural decrease in native soil fertility, and in recent years to apply lime and increase clover plantings.

Practical experience of farmers supported by 20 years experimental results at the Astor Agricultural Experiment Station plainly indicate the need of lime for successful production of many farm crops. Legumes, including clovers and vetch, have helped particularly and resulted in increased yields of other crops. The handicap to extensive use of lime is the present price per ton of one of the principal needs of farmers of Clatsop county is a cheaper source of lime.

Climatic conditions in some years make the matter of properly curing hay a serious problem and it is recommended that the Astor Experiment Station investigate improved methods of field handling and other means of drying and preserving hay crops for winter use, with the idea of preventing loss in quality of hay from rains or from being over ripe. It also is suggested that this investigation include a study of grasses and clovers better adapted to local conditions.

Annual Hay Crops Suggested

Fall planted grey winter oats and common vetch are recommended on better lands. On uplands of poorer fertility the use of hairy vetch and oats is recommended. Seeding rates per acre should be about as follows:

Oats—50 to 60 pounds. Common vetch—40 to 60 pounds.

Oats—50 pounds. Hairy vetch 20 to 30 pounds.

Fall seeded oats alone 80 to 100 pounds.

While fall seeding is advisable, early spring seeding of oats and Austrian winter peas on tideland generally brings fair crops.

On upland in some instances early spring planted oats and peas do well. Spring planted vetch and oats does quite well on tideland.

For late spring planting of hay the use of Schoolmam oats—100 to 120 pounds per acre is adivsed.

Perennial Hay Crops Listed

For use on tideland where lime has been added it is recommended that plantings be on the basis of domestic rye grass 6, meadow fescue 4, timothy 1, red clover 6, alsike clover 3, and white clover 1 pounds per acre.

On limed uplands the use of tall oat grass 6, orchard grass 4, domestic rye grass 4, and red clover 4 pounds per acre is recommended. Farmers are urged to observe carefully the trial plantings of new grasses and legumes at the Astor Experiment Station and in trial plots throughout the county.

Particular attention is called to the possibility of the use of such grasses as Meadow Fox Tail in combination with Ladino clover on tide land and to the new lotus crops now being produced quite successfully there.

It is recommended that the county agent establish a few grass and legume nursery plantings in various agricultural sections of the county.

Of all farm land in Clatsop county 20,156 acres, or 38 per cent is in

pasture. The plowable pasture represents 5,285 acres or 36 per cent of the cultivated area of the county. This does not take into account pasture derived from hay meadows. A recent survey shows that 87 per cent of the use of pastures in the coast area is by dairy cows and 7 per cent additional by young dairy stock, all of which indicates that pastures should be considered from the angle of feed for dairy cows, considering palatability yield, and adaptability.

Grass primarly as a pasture crop and secondarly as a feed and hay crop occupies the possibility of being the most important crop in the county both from standpoint of acreage and cash returns to the farmers. Clatsop county farmers have become particularly grass-conscious in the past two years due to decreases in natural fertility and their extreme interest in improving the forage production by adopting a program for the improvement of their pasture lands. With 80 per cent of the county's total income derived from the balance of animal production and 65 per cent coming from dairy and livestock the importance of the crop is not too strongly emphasized.

Dairymen and livestockmen have had the grass problems brought to their attention in recent years due to serious decreases in pasture yields. Certain fundamental requirements in the development of any well organized pasture program are necessary before any specific recommendations can be made.

1. The average lifetime of Clatsop county grasses even under best conditions is variable and it is not to be expected that pastures seeded with domestic or western rye grass, even though cheap in price, will last more than a few years at best if closely pastured and not allowed to reseed. Such plantings run out in a few years and leave only weeds and grasses of little importance. To combat this, perennial grasses that will last many years should be planted, even though higher in price.

2. Farmers cannot forever take off pastures years of livestock and dairy products without in some manner replenishing the fertility taken away. One of the most logical methods of maintaining fertility on grazing lands is to use a legume crop in the seed mixtures. In many instances successful legume production will be limited by the amount of lime available or applied to the soil.

With the gradual decrease of soil fertility it can only be expected that grasses that will survive will be of less value for pasture purposes and maintenance of soil fertility is essential to combat this condition.

3. The reseeding of pastures is an expensive and long-time program and should be based on a thorough investigation into the crops best adapted for the purpose. It also involves the problem of securing sources of seeds and it is believed that many farmers will make better progress in reseeding their pastures if they will make attempts to grow limited acreages of the desired grasses on their farms.

For use on tidelands plantings recomended are:

Domestic Rye grass 4 pounds per acre.

English Rye grass 4 pounds per acre.

Meadow Fescue 3 pounds per acre.

Meadow Foxtail 2 pounds per acre.

Ladino clover 2 pounds per acre.

Alsike clover 2 pounds per acre.

While the value is recognized of the bent grass seed industry and the large amounts of pasturage available before and after the seed crop, bent grass seed is not recommended for pasture mixtures on tideland because of its tendency to crowd out the other grasses.

On uplands recommended plantings are:

Domestic Rye grass, 4 pounds per acre.

Orchard grass, 4 pounds per acre.

Tall Oat grass, 4 pounds per acre.

Hop clover 1 pound per acre.

Native white clover 1 pound per acre.

More experimental work is desired from the Astor Experiment Station on pasture grasses and legumes on both tidelands and uplands. The experiment station and extension service are urged to make trial plantings of the more prom-

ising crops at various places over the county.

Irrigation on tideland pastures will increase yields approximately threefold. Pastures should be divided so that two and preferably three fields are available for rotation.

The name of Meadow Fox Tail should be changed because this grass, though a good variety, is handicapped in its introduction in the minds of many people by its name and the association of it with certain objectional grasses.

Clipping of pastures to control weeds and other objectional plants should be adopted and it also is advisable to harrow pastures once or twice a year to properly distribute the manure.

Logged Off Lands Present Problem

The larger portion of Clatsop county is timber land and much of it has been or soon will be logged off. These lands present a serious menace to Clatsop county farms unless steps are taken to develop them to the point where they will carry their just portion of the tax burden. Development of experimental areas is recommended where seeding and management problems may be worked out on a practical basis, the Clatsop county court being urged to cooperate with the Astoria Agricultural Experiment Station in this development.

The key to success in establishing a successful pasture on logged-off land is in sowing good seed of the kinds of grasses and legumes suited to the land at a time when there is a good seed bed.

The best seed bed is following the first burn. At that time there is a better bed of ash and loose soil and greater freedom from competing plant growth, grass becoming established with the least competition with other plants and before ferns, vine maple and other perennials become established. Later burns or even late winter periods of freezing and thawing may provide the next best opportunity for sowing.

Where there is little danger of grass being lifted out by freezing and thawing, fall sowing is to be preferred. Late winter sowing as in February is somewhat more certain especially for legumes in places where heaving may take place.

Good seed of the right kinds generally is cheapest, screenings, while low in price per pound, often being expensive for the amount of seed secured than good seed. Screenings also frequently contain quantities of bad weed seeds.

The burn mixtures so often offered for sale in the northwest are frequently little better than screenings. They generally consist of cheap annual seeds like common rye grass, cheat, hop clover, and screenings from seed plants and usually do not provide good pasture over one year and practically no feed after the third year.

It costs as much to sow these temporary grasses as good ones and the sowing cost alone probably is 1-5 to 1-3 the cost of establishing pastures. Where such material is sowed the good seed bed is lost and it is often difficult to secure another.

Because of the cost in controlling the burning over of land and the difficulty of sowing a second seed bed after the first burn, cost of sowing cutover land, and cost of seed itself, it is most economical to use permanent grasses that will provide long lived pastures. Such grasses have been demonstrated in 18 year old sowings near Birkenfeld.

The mixture should include good sod formers, good legumes and other permanent pasture plants. An excellent mixture for cut over lands is:

	Pounds
Astoria or highland bent	1
English Rye grass	3
Domestic Rye grass	3
Timothy	2
Orchard grass	3
Chewings fescue	3
White clover	1
Yellow trefoil	2
Burr clover	3
	21 pounds

This mixture sowed at 9 pounds an acre of good seed will provide about 140 to 150 live seeds per square foot which is enough for an excellent stand of permanent grass. Such a mixture if purchased in quantity should be had for 15 to 20 cents per pound and even if sowed at only 5 pounds per acre is better

than most burn mixtures on the market to be sowed at three to four times as much.

Since the burning tends to destroy any inoculation that may be present in the soil, the white clover, yellow trefoil, and burr clover seed should be inoculated.

On sweet soil three to four pounds of Kentucky Blue grass might be substituted for the bent grass.

Most of the soils of Clatsop county probably are best suited to bent grass. In the more moist and deep soil areas Astoria bent is best. On thin or dry soils highland bent grass is preferred. Except on steep slopes or where the land is very rough or has many logs or dead brush, hand sowing probably is best, airplane sowing having some advantages on the rougher areas.

Root Crop Production Expands

The growing of root crops has expanded very rapidly in Clatsop county the last five years as indicated below:

Year	Acres
1919	180
1929	212
1933 (estimated)	900
1935 (estimated)	487

Decreases the last year or two probably are a result of several factors:

1. General discouragement with prices received for dairy products.
2. Losses of root crops from freezing in field.
3. Tendency toward production of grass seeds and peas.

Root crops are well adapted to Clatsop county and can be produced economically. It is recommended that dairy farmers grow an acre of roots for every six to seven cows.

In sections where turnips do better than mangels it is recommended that Pomeranian White Globe or Imperial Green Globe turnips be used for early fall feeding, Bortfeld turnips for late fall and early winter feeding, and improved American Purple Top rutabagas for winter feeding and for storage. These can best be divided on the following basis:

Pomeranian White Globe turnip ..... ¼ acre.
Bortfeld Turnip ..... ½ acre.
Rutabaga ..... ¼ acre.

It is recommended that turnips be planted as near June 15 as possible, since early plantings will be affected by root maggots, and the late plantings not yielding as well.

In the Brownsmead section mangels have done very well with the Danish Sludstrup varieties best yielders.

Ground for roots should be plowed shallow in the fall, plowed deep in the spring, be heavily manured, and should have an application of superphosphate at the rate of 400 pounds per acre.

The loss of roots from freezing in some years is resulting in less root crops being grown, but this loss possibly may be prevented through the development of proper storage facilities. Investigation on the storage of turnips and rutabagas by the Astor Experiment Station is recommended.

There should be an economic cost of production survey on the cost of growing and storing roots in the coast area and a comparison made with costs of other feeds. The farm management division of Oregon State College is urged to conduct such a survey as soon as consistent with exhisting projects now underway.

Small Grain Acreage Is Small

Very few small grains are grown for threshing except in the Nehalem valley and the acreage appears to be decreasing.

Oats is the principal grain harvested and it is recommended that fall planting is more advisable than spring planting, larger yields resulting. The Grey winter variety is recommended for fall seeding and Schoolmam oats for seed purposes seems to offer good opportunity in the Nehalem valley.

Cranberry production in Oregon is limited to two areas—one in Clatsop county and the other in Coos county.

Production in Oregon seems to have decreased slightly in the past 10 years but indications are that the business is on a more stable basis than at former times. Combined production in Oregon and Washington represents anly a small portion of the total of the United States production, but prices according to United States Department of Agriculture year books

have been higher in Oregon and Washington than in most sections over a period of years.

The following figures show the production in Oregon and Washington as compared to the United States and prices recevied over a period of years:

Cranberries—Production in Barrels.

State	1926	1927	1928	1929	1930	1931	1932	1933
Oregon	7,000	6,000	6,000	5,800	3,000	5,000	2,300	3,900
Washington	16,600	21,000	22,000	11,000	3,480	9,000	7,536	4,800
Rest, U. S.*	723,000	469,000	523,000	531,200	554,000	637,000	385,164	461,300

*Massachusetts, New Jersey, Wisconsin.

December 1, Price per Barrel.

	1926-1931 Average	1932	1933
United States average	10.59	7.13	5.62
Washington	11.30	3.50	7.95
Oregon	11.17	8.50	7.95

It is believed that there is a large acreage of land suitable for cranberry production in Clatsop county. Practically all of this land is in its native state and although it would require clearing and development it may be available at relatively low prices. Cranberry production on the Pacific coast is limited to Oregon and Washington and the present production is not sufficient to supply the demands o the Three Pacific coast states. It is reported that approximately 22 carloads of western berries went to California markets in 1935 out of a total California consumption of approximately 175 cars.

Recent tendencies in production in the eastern states have been to decrease acreage due to certain diseases particularly the one known as "false blossom". Success with cranberries requires careful attention to details including land preparation and leveling, suitable irrigation, water supply and equipment, close spraying, and frost control.

Both cooperative and private marketing agencies are available. Average yields of good growers have been about 60 barrels per acre, the averages of eastern growers being much less. The disease "false blossom" has not been introduced into Oregon or Washington but stands as a menace to the industry unless steps are taken to prevent its introduction.

It is recommended that the state department of agriculture be requested to place a quarantine against the importation of cranberry plants and berries (if the berries can spread the disease) and that the Oregon department refer a similar quarantine to the Washington state department of agriculture.

It is further recommended that the general chairman of this conference appoint a committee of cranberry growers to confer with Washington growers across the Columbia river from Clatsop county.

It is suggested that any expansion in cranberry production be on a very gradual and careful basis and be done only by those experienced in the business.

The growing of flower bulbs in Clatsop county is an industry that has been established in the past 10 years. Clatsop county has many acres adapted to the growing of bulbs for forcing purposes and with the trend towards smaller farms this crop, which is very intensive, might be used if other economic limitations can be overcome.

The bulbs grown commercially are narcissus, plantings amounting to approximately 23 acres. Development of this industry was brought about largely by federal quarantine against the importation of bulbs from Holland.

The withdrawal of quarantine restrictions and the entering into trade agreements with bulb producing countries is a serious menace to the bulb industry. This menace not only is due to lower competitive prices caused by cheap foreign labor, but principally to the danger of the introduction of serious pests and diseases into this county.

It is recommended that this prob-

lem again be brought to the attention of the Oregon delegation in congress at Washington, D. C., and that the members be urged to continue their efforts to keep the federal quarantine in effect.

Only commercial forcing varieties should be grown such as King Alfred, Spring Glory, and Von Sion. Further expansion in the growing of Golden Spur is not advised, due to limitations in market.

King Kong, the 30-foot giant ape of moing picture, really was only a man-made toy, 20 inches tall. Trick photography made him appear as a hideous creature of enormous proportions.

LIVESTOCK COMMITTEE REPORT

Clatsop county has from 100,000 to 200,000 acres in logged off lands that might be used successfully as a means for grazing livestock. These lands are not suitable for agricultural purposes because of soil types, rough topography, and lack of summer moisture but can be used for sheep grazing and to a limited extent with beef cattle. The lands are not suited to the growing of grains or hay as they dry out too badly during the summer due to the shallowness of the soil. It also has been demonstrated that this type of land cannot be used to successfully maintain a farm family throughout the year.

It is recommended that such lands be seeded to grass immediately following a burn after logging. The grass will support a reasonable number of livestock for a period of years or until such time as young tree growth and brush crowd out the edible plants.

Pasture mixtures of permanent grasses acceptable for such a project are orchard grass, blue grass, English rye grass, white clover, velvet grass, and Highland bent. The grass will run out in 10 to 12 years and provision should be made for reseeding of timber when the pasture is no longer profitable for grazing. Where there is a scarcity of seed trees it is recommended that additional seed stock be planted at the time of seeding to grass, thus aiding in restocking the land with timber when the grass is gone.

It would be well for the Clatsop county court to furnish a tract of this delinquent land to the Oregon Agricultural Experiment Station. Experimentation and study to determine better pasture grasses and mixtures for logged off land and best methods of handling such lands on a long-time or permanent basis would be possible.

Past experience and observation have led to the belief that a combination of pasturing followed by reforestation is the best method of handling logged off lands.

While beef cattle might be used in a limited way, fencing is required for this class of stock. The lands are better suited to the summer grazing of sheep from eastern Oregon or similar territory, sheep utilizing much of the existing weeds and brouse. This method of handling of these lands may be expected to supply an income to the county covering tax - delinquent areas and the lands of private owners, greatly relieving the tax burden.

To handle successfully the grazing of these lands by sheep it would be advisable to follow plans developed in other counties whereby a grazing allotment board is esablished. This body has authority to establish boundaries and makes rules to prevent encroachment on grazing lands needed and used by stockmen owning farms adjacent to the logged off region. Such a board should consist of members of the county court representing the county lands, timber owners representing their interests, and farmers from the section of the county affected.

Experience indicates that little or no damage is done to young tree growth by careful grazing with livestock, thereby encouraging reforestation and simultaneously reducing the fire hazard.

The carrying capacity of these lands should not be too heavy. Unless good grass pastures were established it would require 10 acres to support a cow, and two and a half to three acres her head for sheep. Established grasses may be expected to give a higher carrying capacity.

Heavy grazing or over-grazing is inadvisable because of injury to the feed.

A few head of beeg cattle can be kept profitably on some Clatsop county farms where there is outside grazing land, the animals being sold to local trade, either dressed or alive as the circumstances warrant. It will be best if beef breeds are used for this enterprise. It has been the experience of Clatsop county raisers that calves sohuld be dropped in March and sold the sec-

ond spring when they get fat on grass, the animals dressing out from 300 to 400 pounds. Such an enterprise will increase the farm return with little added expense.

Horse Raising Is Encouraged.

In view of the interest in the production of draft horses on Clatsop county farms, it is recommended that an effort be made to encourage owners of stallions to make regular visits with their horses throughout Clatsop county.

Commercial Hog Production Discouraged.

Hog productoin is encouraged on Clatsop county farms as a means of utilizing farm wastes.

REPORT OF FARM ECONOMICS COMMITTEE

County Zoning Law Proposed.

In past years farms have been developed on lands suited to agricultural purposes. Brush and timber has grown up on land that should have been used for grazing and towns have been promoted and expanded on lands better suited to farms, and through such misuse of land serious social and economic problems have arisen. It is recommended that the Oregon state planning board be requested to prepare an agricultural zoning law that will permit the county courts to zone a county into areas suitable for major enterprises and to prohibit land uses which have in the past proven contrary to the best interests of the individual and of the public. Such a zoning should be optional to county authorities rather than be controlled by the state.

Study Logged Off Land Plan.

Much attention has been given to the problem of grazing on logged off lands, seeding of grasses on these lands, and their proper management. While such grazing and seeding is recommended, knowledge of the proper methods of seeding and of grazing management and of the effect of such management upon tree growth is not adequate. It is suggested that the Clatsop county court set aside one or more areas of county owned logged off lands as experimental areas to determine the best use of such lands. It is further recommended that the county court in establishing and maintaining such experimental areas obtain the assistance and cooperation of the various departments of the Oregon agricultural experiment station and particularly the John Jacob Astor experiment station.

Assistance of the CCC camps might be obtained for fencing and other physical improvements. The John Jacob Astor experiment station should conduct such experimental work as may be necessary to determine suitable winter feeds for livestock that may be grazed on the lands during the summer. In these experimental investigations especial attention should be given to the possibilities of utilizing the hay from threshed bent grass together with fish meal and such other supplements as may be suitable and available.

Warrenton Division Is Suggested.

After consideration of that portion of Clatsop county known as the Warrenton area, now largely owned by the county or soon will be owned, it is recommended that the portion of this area east of the proposed ridge road be drained and improved as farming land. The county is asked to retain ownership of this area until the land has been drained and improved and its true value for agricultural purpaoses ascertained. It is suggested that the portion of the Warrenton area west of the proposed ridge road and extending from Fort Stevens to Camp Clatsop, de developed as a recreational and wild life area, ownership to remain permanently with Clatsop county. In the development and maintenance of this area the county should seek the cooperation of the United States biological survey, the United States soil conservation service, and the department of wild life management of the Oregon agricultural experiment station.

The Oregon reforestation law limits the tax on land classified as reforestation land to 5 cents an acre. regardless of public debt or other obligations. This appears to permit the owners of such lands to escape completely the bonded debt of the community and thereby to increase the bonded debt of agricultural and other lands by a proportional amount. In the meantime the county tax base is being reduced further by the foreclosure on many thousands of acres of tax delinquent land.

This situation involves serious danger to the farmers of Clatsop county and it is recommended that a permanent committee be appointed by the chairman of the Clatsop outlook conference to make an extensive study of this problem, particularly as it concerns agricultural lands, and to work with the county court and other public agencies to seek some solution to this problem. It is recommended further that this committee be empowered and instructed to call such meetings of farmers or other persons interested as may appear necessary to promote its objective.

REPORT OF DAIRY COMMITTEE

The number of dairy cows in the United States increased rapidly from 1928 to 1934, reaching a peak in 1934. Since that time the number probably has decreased. In the fall of 1935 the number of cows per capita in the United States was about normal, the following table indicating the trend for the past 25 years in numbers of dairy animals in the United States, the 11 western states, the state of Oregon, and Clatsop county.

Dairy Cattle Numbers (Two Years Old and Over)

Year	United States	Eleven Western States	Oregon	Clatsop County
1910	20,625,000 (2)	1,341,000 (2)	152,000 (2)	
1920	21,455,000 (3)	(4) 1,541,000 (3)	200,000 (3)	3,709
1925	22,575,000 (3)	(4) 1,623,000 (3)	217,000 (3)	5,164
1930	23,106,000 (3)	(4) 1,814,000 (2)	222,000 (3)	5,146
1935	26,236,000 (3)	(4) 2,264,000 (3)	(4) 270,000 (3)	*4,800

(1) June 1. Source: U. S.) U. S. census reports
(2) April 15. 11 Western)
(3) January 1. Oregon, 1920, 1930, Livestock,
(4) Estimates by B.A.E. Meat and Wool Market Statistics.
*Estimates.

Considering the limitations of available feed developments of dairying in Clatsop county should attain at least a normal position. The number of dairy cows in this county has decreased since 1930 although dairying here has been established many years, being well adapted to this area.

A long time program of permanent agriculture in Clatsop county, considering particularly the soil fertility problem, will place dairying in a major position. Agencies working closely with the agricultural program of the county should encourage a natural healthy growth of the dairy industry based upon the improvement of pastures and the production of home-grown feeds.

Future development of agriculture in Clatsop county should encourage dairying on lands suitable for the enterprise from the standpoint of natural conditions favorable to dairying and for the value the livestock enterprise has in maintaining the fertility of the soil.

While the number of cattle in the county has decreased somewhat in the last year there has been the tendency to increase the production per cow. This condition is noted especially in the areas where records are kept on individual herds. An increase also is evident through the receipts of various plants receiving dairy products.

Demands of the population in the United States kept ahead of the supply of dairy products until 1933, when, due to increased numbers of cows, increased production, and a lowered consumer demand, a definite and clear cut surplus of dairy products accumulated. Because of the rapid increase in the number of cows in the United States from the period beginning in 1929, it is probable that even if normal consumer demand had prevailed, there would have been a definite drop in the prices of dairy products.

The 11 western states market their dairy products at home, thus maintaining a higher price level for the area. On the Pacific coast markets where the products are consumed, this usually has amounted to the freight differential between Chicago and west coast points.

The following table price shows relationship for 92 score butter between Chicago, Portland and San Francisco.

Average Wholesale Price of Butter, 92 Score, Over the Past Six-Year Period

Year	Portland	San Francisco	Chicago
1935	29.2	30.12	28.78
1934	24.3	25.05	24.78
1933	†20.4	21.11	20.79
1932	*23.5	21.98	20.07
1931	*29.4	28.13	27.05
1930	*35.5	36.31	35.28

†10-month average (no prices for July and August).
*Jobbing quotation, 92-93 score prints. Source: Northwest Dairy Produce).
Source: (San Francisco and Chicago) 1930-1934, U.S.D.A. Yearbook, 1935. 1935, Monthly Review of Domestic Dairy Markets, B.A.E.
These quotations are all at wholesale except the Portland prices for 1930, 1931, and 1932 which are jobbing for 92-93 score prints.

In the case of Oregon, however, a definite surplus is produced and Oregon producers must bear the cost of freight to California and Seattle markets. If the 11 western states should increase their production above the demand within the states the surplus would be shipped east. Such a condition would force the price level down to absorb the freight to the point of delivery and producers would have to reduce production costs to absorb lower prices received.

Population Over a 44-Year Period for the United States, 11 Western States, and Oregon

Year	United States	11 Western States	Oregon
1890	62,947,714	3,102,269	317,704
1900	75,994,575	4,091,349	413,536
1910	91,972,266	6,825,921	672,765
1920	105,710,620	8,902,972	783,389
1925*	113,493,720	10,182,261	846,061
1930	122,775,046	11,896,222	953,786
1934	125,693,000	12,530,606	983,000

*Estimated. 1890-1920-1934—Statistical abstract.
1925—World Almanac for 1926.
1934—World Almanac for 1935.
(Tabulated by the Oregon State Agricultural College Extension Service.)

Improvement of Sires Needed.

During recent years when low prices have prevailed inferior bulls, mainly for the purpose of freshening the cows, have been used by many farmers. This practice is discouraged and although there are are many good sires in Clatsop county there is room for many more. Improvement of sires must follow an improvement program through dairy herd improvement associations, there being no other method at present to prove sires. Dairy herd improvement associations have been found successful where tried.

Shipment of feed into the county for dairy purposes has gradually decreased during the past few years. This statement applies to both hay and grain. This decrease has been created by a program of growing more feed at home. One of the chief problems facing the industry is improvement of pastures and hay, these two problems being very closely connected in a dairy program.

The dairymen in Clatsop county should continue to grow as much of their own feed supply as possible. Suggestions on growing feed may be found in the report of the farm crops committee on pastures, hay, and root crops.

The following is suggested as a normal guide for dairymen relative to grain feeding:

1. Cows producing less than 25

pounds of butterfat per month usually can not be fed grain profitably.

2. Cows should be fed according to their production rather than the herd average.

3. A good program for Clatsop county may be one of the following, all fed in conjunction with pasture:

Hay and roots or grain added.

Hay, silage, and roots.

Hay and silage or grain added.

Hay and grain.

The lower Columbia area has established a reputation for high quality dairy products, this condition being created by cooperation of the dairymen with the various agencies marketing the products. Dairymen should be encouraged to watch closely their conditions of production, making improvements in sanitary conditions on their places consistent with the price received for the product so manufactured products of the county not only can maintain but improve this favorable reputation. One effect of such quality production will be a better market for the products.

It is recommended further that the assistance of the Oregon agricultural extension service be solicited for information on sanitary conditions affecting the quality of milk, coolers, and milk houses.

Consumption of Dairy Products May Increase.

The consumption of dairy products in the country as a whole varying with the trend of wages paid in industrial pay rolls has suffered, particularly butter, in the same proportion as wage earners' incomes have decreased. There is some indication that employment conditions are improving with a consequent increase in the consumption of dairy products. Improvement in the quality of the product should be stressed since the immediate future for the consumption of dairy products is brighter.

One of the chief factors influencing the consumption of dairy products is the competition of substitutes, especially those for butter. The excise tax placed on the importation of vegetable oils, particularly cocoanut oil, has not been of much help to the situation because manufacturers of these substitutes have turned to the use of domestic vegetable oils. A federal tax on butter substitutes now being proposed by the dairy industry of the whole country so that substitutes of butter wil bear their share of the tax burden comparable to that of the dairy industry is advocated.

Such a tax would narrow the price margin between the price of butter and substitutes and encourage the use of more butter inasmuch as the prices would be more on a parity. Dairymen can support their own industry by refraining from purchasing butter substitutes and working to discourage the use of butter substitutes by those with whom they deal.

Clatsop county is recognized as exceptionally free of dairy cattle diseases. This applies to both tuberculosis and Bang's disease. This condition has been brought about largely by the cooperation of the county court for several years in making it possible for dairymen to test their animals without cost. Other factors contributing to this result are the educational work of the Oregon agricultural extension service and the work of the local veterinarian.

Since Clatsop county has been free of tuberculosis in dairy cattle for several years and now is considered free of Bang's disease, it is recommended that every effort on the part of the dairymen be made to maintain this position. It is believed that they can do this best by supporting the newly enacted state law for the control of Bang's disease.

Under the conditions existing in Clatsop county heifer calves from the best cows should be kept for replacements. It is believed that an average of three dairy heifers per year for each 10 cows should be raised for normal replacements.

Possibilities are recognized for an outside market for good dairy animals but due to the cost of producing a dairy heifer to maturity it is believed that it is not profitable to grow heifers for outside sale under most conditions existing on farms in Clatsop county. Production of heifers for outside sale may be profitable on farms in the county that have a surplus of pasture.

There may be an opportunity to supply some of the future demand for dairy cattle by growing a few heifers in excess of the need for replacement, keeping the animals

until they reach maturity. The dairymen then wil have realized two or three years of production, had a chance to know something of their production and can then sell the surplus in the form of mature cows.

Herd Improvement Groups Favored.

Organization of a dairy herd improvement association in Clatsop county is approved, for it is recognized that no dairyman can cull his herd accurately without individual records. Clatsop county probably has some of the best dairy animals to be found, although there likely are many low producers, and in the interest of a sound dairy program formation of a herd improvement association could be one of the most important factors in improving the dairy situation.

Appointment is urged of a dairyman from each dairy section of the county to work with the state college extension service in organizing a herd improvement association. After such an association is formed pblicity should not be given to records, either on herds or individual animals. This recommendation is made because it is believed the publishing of records has done more to cause failure of many associations than any other factor especially in those associations where it is necessary in some cases for owners to do their own sampling.

Market Outlets Satisfactory.

Clatsop county is fortunate in having an exceptionally favorable marketing setup for dairy products, many finding favorable market milk outlet in Astoria, Seaside and other small towns. Dairymen not equipped for the production of market milk or those too far removed from the market milk shed will find a ready market either for milk shipped to creameries or sweet cream, the milk being separated on the farm and sent to creameries.

A strong dairy cooperative association is operating through which dairymen can market their dairy products cooperatively. Independent dealers also serve the county.

Butter and ice cream are the chief manufactured products of the dairy industry in Clatsop county, known for quality dairy products. Fat diverted to the manufacture of ice cream gives dairymen the benefit of that premium. In case of butter manufacture the by-products such as dried milk are valuable to the dairyman since he can realize a market for his entire output through butter and powdered milk.

Investigations at the Oregon agricultural experiment station indicate minerals most commonly deficient in Oregon feed stuffs are calcium and phosphorous, and that these can be supplied economically through the use of sterilized bone flour. For those who desire additional information on mineral feeding, attention is directed to state bulletin 309, available in the office of the county agent.

Although elimination of Bang's disease from Clatsop dairy herds has been efficient there are large numbers of cows of breeding age that fail to get with calf, indicating a serious problem of sterility in dairy cattle that is costly to cattle owners. There appears to be no effective remedy or cure for this trouble and the director of the Oregon agricultural experiment station is urged to institute investigations to determine the cause or to find a remedy for this condition.

ASTORIA IN 1811